

Amendment to the Claims

1 - 11. (canceled)

12. (currently amended) A plasma processing apparatus for processing a sample using a plasma generated within a plasma generating portion comprising:

~~a vacuum chamber enclosing a portion where plasma is generated and having an flat upper face and an inclined side wall around the portion such that the vacuum chamber has a trapezoidal form in cross-section~~ said plasma generating portion to establish a vacuum therein, the vacuum chamber having a flat upper face, an inclined side wall member and a trapezoidal cross section;

~~an antenna coil wound around said side wall;~~

~~a power source for supplying a predetermined frequency electric power to the antenna coil;~~

~~a Faraday shield disposed in a floating position to a ground and provided around said side wall enclosing the portion;~~

a Faraday shield provided around said inclined side wall member and disposed in a floating position to a ground while said plasma is generated;

a coil antenna for generating an electric field in said plasma generating portion, the coil antenna being wound around said inclined side wall member and outside of said Faraday shield wherein a direction in which said coil antenna is wound is perpendicular to a slit provided in said Faraday shield;

a radio frequency power source for supplying radio frequency electric power to said antenna;

a gas supply unit for supplying gas into said vacuum chamber;

a sample stage disposed inside said vacuum chamber on which a sample to ~~be processed~~ is placed; and

a discharge unit disposed below said sample stage for discharging the gas ~~below said sample stage out of said vacuum chamber~~ in a space around said sample stage out of said vacuum chamber wherein there is disposed a path along an inside of said inclined side wall and said space around said sample stage.

13. (previously presented) A plasma processing apparatus according to claim 12 further comprising:

a plate made of a conductor or a semiconductor and placed on an inner side of the upper face of the vacuum chamber.

14. (previously presented) A plasma processing apparatus according to Claim 13, further comprising:

a radio-frequency power source applied to said plate so as to apply radio-frequency waves to said plate.

15. (previously presented) A plasma processing apparatus according to claim 13, further comprising a DC voltage source applied to said plate so as to supply DC voltage to said plate.

16. (previously presented) A plasma processing apparatus according to Claim 13, wherein said plate is grounded.

17. (previously presented) A plasma processing apparatus according to Claim 12, wherein a radius R_d of lower face of said trapezoidal form and a height H from said sample stage to the upper face have a relation such that $H / R_d \leq 1$.

18. (previously presented) A plasma processing apparatus according to Claim 12, wherein a radius R_u of the upper face and a radius R_d of the lower face and a height H from said sample stage to the upper face have a relation such that $\tan^{-1}\{(R_d - R_u)/H\} \geq 5$.--